

Product Features

- Frequency from 5.4 ~ 5.9GHz
- GaN HEMT
- 50 Ohm Input/Output impedance
- High efficiency

Applications

- Radar system

Description

The RRP54591K3-43 is designed for Radar system application frequencies from 5.4 ~ 5.9GHz.

This module uses GaN HEMT technology which performs high breakdown voltage, wide bandwidth and high efficiency.

Electrical Specifications @ $V_{DS1}=50V$, $V_{DS2}=6V$ $T=25^{\circ}C$, 50 Ω System

PARAMETER	UNIT	MIN	TYP	MAX	SYMBOL
Operating Frequency	MHz	5400	-	5900	f_o
Operating Bandwidth	MHz	-	500	-	BW
Output Pulse Power	W	1200	1300	-	P_o
Input Pulse Power	dBm	-	19	-	P_i
Power Gain	dB	41.8	43	-	G_P
Gain Flatness	dB	-	-	± 0.5	ΔG_P
Duty Cycle	%	-	-	10	DC
Pulse Width	us	-	-	100	PW
Efficiency	%	25	35	-	E_{ff}
Amplitude Pulse Droop	dB	-	0.5	1.0	Droop
Harmonics 1 to N	dBc	40	-	-	H_N
Spurious Level	dBc	60	-	-	Spur
Rise Time	ns	-	-	100	t_r
Fall Time	ns	-	-	100	t_f
Input VSWR	dB	-	-	1.5:1	VSWR
Output VSWR	dB	-	-	1.5:1	VSWR
Switching Time	us	-	0.1	-	t_{sw}
Phase Deviation	$^{\circ}$	-20	-	20	$\Delta\phi$

* Test Pulse conditions = 100us, 10%

* Custom design available

Absolute Maximum Ratings

PARAMETER	UNIT	RATING	SYMBOL
Operating Junction Temperature	$^{\circ}C$	225	T_j
Operating Flange Temperature	$^{\circ}C$	-20 ~ 85	T_c
Storage Temperature	$^{\circ}C$	-40 ~ 125	T_{STG}

*The transistor MTTF is 3.0×10^7 hours at the junction temperature $225^{\circ}C$ with duty cycle 10% and pulse width 100us and can vary depending on pulse operating conditions and junction temperatures.

*Based on the base plate temperature $50^{\circ}C$, the expected MTBF of the RRP54591K3-43 is around 146,000 hours.

Operating Voltages

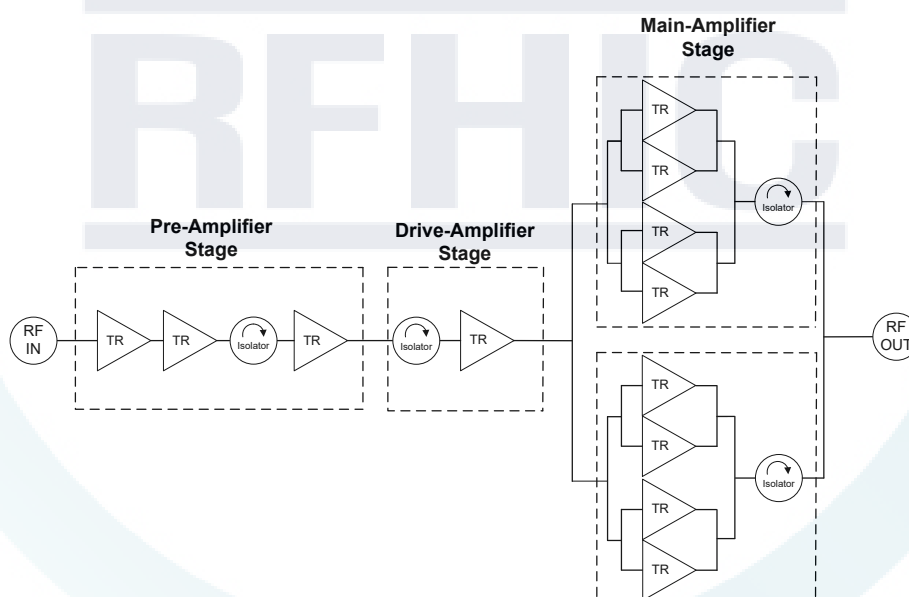
PARAMETER	UNIT	NOMINAL VOLTAGE	VOLTAGE ACCURACY	SYMBOL
Drain-Source Voltage	V	50	± 2%	V _{DS1}
Drain-Source Sub Voltage	V	6	± 2%	V _{DS2}
On/Off Control Voltage	V	TTL Low(0V) : PA OFF, TTL High(5V) : PA ON		-
Peak Monitor Voltage	V	1.5V@5.65GHz, 60dBm (dB/30mV)		-
Temp Monitor Voltage	V	0.75V@25°C (1°C/0.01V)		-

Power Supply

PARAMETER	UNIT	MIN	TYP	MAX	SYMBOL
Drain-Source Current(AVG)	A	-	8.0	10	I _{DS1}
Drain-Source Sub Current(AVG)	A	-	0.03	0.05	I _{DS2}

* Duty Cycle 10%, Pulse Width 100us

Block diagram

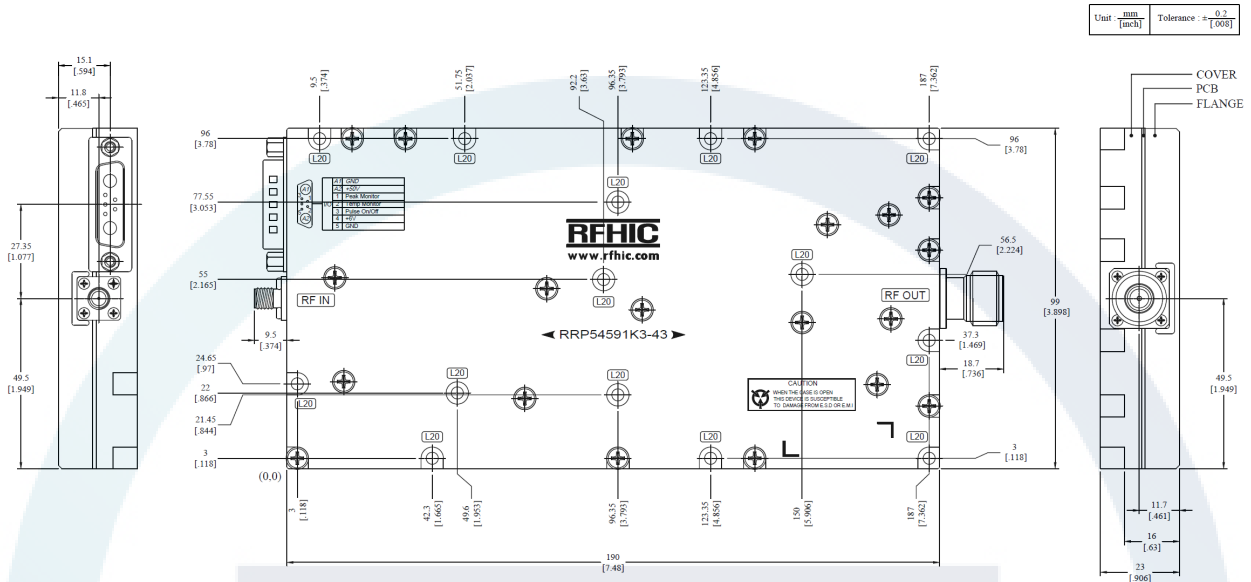


Mechanical Specifications

PARAMETER	UNIT	TYP
Mass	kg	0.8
Dimension	mm	190 x 99 x 23
RF Connector	-	SMA Female : RF Input
		N Female : RF Output
DC Connector	-	D-Sub 7-Pin(7W2), Male : Supply

Outline Drawing

* Unit: mm[inch] | Tolerance : ± 0.2 [.008]



Pin Description

Pin No	Description	Pin No	Description
A1	GND	1	Peak Monitor
A2	V _{DS1} (+50V)	2	Temp Monitor
		3	Pulse On/Off
		4	V _{DS2} (+6V)
		5	GND

Revision History

Part Number	Release Date	Version	Modification	Data Sheet Status
RRP54591K3-43	2019.11.22	0.1	-	Preliminary
RRP54591K3-43	2020.01.13	0.2	-	Preliminary
RRP54591K3-43	2020.01.28	0.3	-	Preliminary



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